STAR 2006: NOAA Ship *David Starr Jordan*
Weekly Science Report

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Science Summary: 10-16 August 2006

We had an abbreviated workweek – four days in the Gulf of California, then an in port in Mazatlan, Mexico for three days. We spent our sea time traveling up the west side of the Gulf and back down the east side. The Gulf at times seems to be filled with one continuous school of bottlenose dolphins (*Tursiops*). Our survey methodology was specifically designed to deal with discreet schools of dolphins, rather thinly distributed over the open ocean; we don't handle high densities of individual animals thinly scattered over miles and miles. Turn the temperature up to 100°F or so and observer frustration usually pegs out by mid-day. However, our seasoned crew of observers seems to take it in stride with minimal fuss. We found a big slug of sperm whales at the northern end of our reach, and lots of fin whales along the east side. The sea temperature at times was 90°F; at other times the water has been so productive that the sides of our flow-through aquaria began to turn mossy green. We will all be happier when the water color reverts to a more manageable blue and the dolphins organize themselves back into regular schools once again.

Lest we start to get too cocky about our abilities to identify marine mammals in the field, we have been scratching our heads over some of the medium-sized rorquals (baleen whales; *Balaenoptera* sp.) we have encountered so far. Up until recently, this category was reserved for only Sei and Bryde's whales, and differentiation was mainly a matter of determining whether the ridges on the rostrum numbered 1 (Sei) or 3 (Bryde's). But recently, two new species of Bryde's-type whales have been described (Eden's whale and Omura's whale) and it is not clear what their ridge situation is. Although the validity of these species is in question, we are still on the lookout for anything different although we're not quite sure what we might be looking for: new species of whales are typically described from skulls and/or genetic sequences, leaving us field workers pretty much on our own to figure out what the live animals look like. And actually we like it that way.

On the way down Baja during Week 1 we probably saw more Baird's beaked whales (*Berardius bairdii*) than on all the previous ETP cruises combined. Then we heard that a group of 11 stranded on one of islands in the central Gulf of California two weeks ago, and this week we found an adult male, long dead, floating on the water in the mid-Gulf. It seems to be an invasion year for this N Pacific species. We have also seen a couple of very skinny blue whales and lots of dolphins with their ribs showing. It could be a lean year for cetaceans off Baja. Our bio-event of the week would have to be Captain Alex jumping in to catch a couple turtles for us; just another example of NOAA Corps going overboard to support the scientific effort!

We lose two of our party in Mazatlan this in port: Manuel Inclan, our Mexican observer, and Mark Harris, our teacher-at-sea – they were very helpful in our many scientific endeavors and we will miss them both. Mark was especially helpful in getting up every morning to assist with

the 0430(!) CTD – oceanography never sleeps. With the increasing number of Mexican scientists, crewmembers, and national observers we have onboard, there is noticeably more South of the Border music on the back deck of the Jordan these days; it is like a Cozumel Club Med back there. Perfect mood music for our tropical cruise.

One of our freezers went down in port, it went unnoticed and a lot of hard won samples thawed out (fish isotope studies, flyingfish specimens, turtle blood, etc.) – steps are being taken to make sure it doesn't happen again. The part shipped down for our maimed starboard winch arrived, but it is the wrong part. We will try it again in our next port stop (Punta Arenas, Costa Rica); in the meantime we will be attempting tows on the port side.

Sightings and Effort Summary for Marine Mammals

Date	Start/ Stop Time	Position	Total nm	Average Beaufort
081006	0555	N23:07.49 W108:40.59	54.0	1.6
	1847	N24:31.77 W109:20.02		
081106	0610	N25:38.83 W110:24.09	77.7	2.8
	1900	N26:55.54 W111:22.63		
081206	0558	N26:32.60 W110:10.72	71.1	2.9
	1827	N25:17.76 W109:08.75		
081306	0557	N24:16.62 W108:17.58	67.0	2.7
	1833	N22:58.73 W107:15.34		
081406-081606	In Mazatlan, Mexico			

Code	Species	Number of Sightings
001	*Mesoplodon peruvianus*	1
002	*Stenella attenuata* (offshore)	5
003	*Stenella longirostris* (unid. subsp.)	4
010	*Stenella longirostris orientalis*	1
015	*Steno bredanensis*	10
017	*Delphinus delphis*	6
018	*Tursiops truncatus*	18
021	*Grampus griseus*	13
046	*Physeter macrocephalus*	6
048	*Kogia sima*	5
049	Ziphiid whale	2
051	*Mesoplodon* sp.	2
061	*Ziphius cavirostris*	1
063	*Berardius bairdii*	1
070	*Balaenoptera* sp.	2
072	*Balaenoptera edeni*	1

Code	Species	Number of Sightings
074	*Balaenoptera physalus*	7
077	unid. dolphin	9
078	unid. small whale	3
079	unid. large whale	2
080	*Kogia* sp.	1
090	*Stenella attenuata* (unid. subsp.)	1
098	unid. whale	1
099	*Balaenoptera borealis/edeni*	1
Total		103

Photography (Cornelia Oedekoven and Laura Morse)

The highlight of this week for us photographers was a large aggregation of sperm whales detected on the second day of our northerly way into the Sea of Cortez. Between the photographic efforts from ship and small boat, we obtained fluke images of 18 different individual whales.

Dolphins were also numerous again this week - 19 schools were photographed. The last day of our leg we were within the northern range of Tres Marias spinner dolphins. We encountered three single-species schools of unidentified spinner dolphins. We hade to leave the final ID as “unid” because on one hand, they displayed a behavior known for the Tres Marias variation: tightly packed schools and very “friendly” towards the ship. On the other hand, they did not have the elongated body shape of that variation but looked like eastern spinner dolphins.

Species	Weekly Total		Grand Total	
	Number of Sightings	Individual IDs	Number of Sightings	Individual IDs
Stenella attenuata (offshore)	4	13	7	15
Stenella longirostris (unid.)	3	25	3	25
Stenella longirostris orientalis			0	
St. l. orientalis/a (offshore)			1	
Stenella coeruleoalba			2	
Steno bredanensis	2		3	
Delphinus delphis	3		10	20
Tursiops truncatus	5		9	
Grampus griseus	2		5	
Globicephala macrorhynchus			1	
Physeter macrocephalus	1	18	3	20
ziphiid whale			1	
Berardius bairdii	1	1 (dead)	3	1
Balaenoptera edeni	1		1	
Balaenoptera physalus	2	2	2	2
Balaenoptera musculus			11	15
Stenella attenuata (unid.)	1		1	
Balaenoptera borealis/edeni			5	

Biopsy (Juan Carlos Salinas and Ernesto Vásquez)

Species	Common Name	Weekly		Total	
		Samples	Takes	Samples	Takes
Balaenoptera edeni	Bryde's whale	2	2	3	3
B. musculus	Blue whale	0	0	8	16
Physeter macrocephalus	Sperm whale	8	8	8	8
Globicephala	Short-finned pilot whale	0	0	8	19
Delphinus delphis	Short-beaked common	0	0	15	32
Stenella attenuata	Pantropical Spotted	4	8	12	23
S. coeruleoalba	Striped dolphin	0	0	1	3
S. longirostris orientalis	Eastern spinner dolphin	3	8	6	20
Tursiops truncatus	Bottlenose dolphin	10	17	13	22
Total		27	43	74	146

Bird Buzz (Rich Pagen and Chris Cutler)

Searing heat, glaring sun and a river of sweat from our brows were constant companions in the Sea of Cortez this week. Flat calm conditions revealed mighty Black and diminutive Least Storm-Petrels, at times in flocks numbering into the hundreds, with one such assemblage attending the nibbly-bits of flesh and the slick of oil emanating from a dead Baird's beaked whale. Also present were wandering Black Terns (many still showing signs of their beautiful

black breeding plumage), and the occasional Red-billed Tropicbird sitting on the water. Blue-footed Boobies became common as we headed back south along the coast of western Mexico, and we spotted a few Townsend's Shearwaters. Our first wayward landbirds of the trip were seen flying around the ship: Northern Mockingbird, Cliff Swallow and a probable Yellow Warbler.

The abundance of marine debris was rather moderate this week, with plastic milk jugs our most common encounter. Several of the sea turtles tagged this week were associated with marine debris (or was the marine debris searching out the turtles?). Turtles were found around a piece of cut lumber, a cluster of sticks, a milk jug, and four hung close to a decaying pallet. Two turtles were entangled in marine debris: one in a gill net, and another with a *costal* (woven plastic food transport bag, very common in Latin America) around its neck.

Turtle Operations (Lindsey Peavey, *et al.*)

This was a very exciting week for turtles. We hit an olive ridley "hot spot" and thanks to our fabulous crew who kept the turtles coming onboard, and to the help of my fellow turtle-loving shipmates, we were able to process 19 turtles on 10 August alone. We gave a few entangled turtles new life by removing the gill nets and plastic bags that were restricting their breathing and swimming. It's a tough ocean out there if you are a turtle who can't dive to forage, swim away from danger or take deep breaths at the surface. On 13 August we had another exciting event - deploying our first PAT tag on a large, mature male olive ridley. The tag trails behind the turtle for 10 days, then "pops" to the surface to transmit data via satellite back to the lab in La Jolla. The information we collect will tell us how deep and for how long the turtle dives. Knowing more about their dive behavior can help us modify fisheries gear and practices to avoid the depths the turtles inhabit the most while feeding. Knowing how much time turtles spend underwater will also allow us to better interpret our sightings data so we can estimate the number of turtles at sea in the eastern Pacific.

Species	**Common name**	**Number sampled**	
		Weekly	**Total**
Caretta caretta	Loggerhead	1	8
Lepidochelys olivacea	Olive ridley	29	32
	Total	30	40

Squid Ops (Iliana Ruiz-Cooley)

On 11 August, three days before the end of the first leg, we had another successful day with the squid collection. At 8 pm, we started the jigging effort. Two minutes passed when I heard the first excited call of "SQUID!" A 3 cm mantle length (ML) *Dosidicus gigas* was collected. As soon as I ran to put the tiny squid in a labeled plastic bag, more people excitedly yelled…SQUID!! To my surprise, they caught medium size squids and suddenly large size *Dosidicus*. On the back deck, the number of people, cameras, video cameras, rod and reels, and jigs increased in seconds. The Humboldt squiding time had started. It took 30 minutes to catch 33 squids. The largest squid measured 117. 4 cm total length and 68.4 ML and weighed 12 kg. It

was a mature female. We measured, weighed and collected the tissues samples in just two hours thanks to the help and support of many scientists and crewmembers.

Fish Sampled for Diet and Isotope Analysis

Species	Samples	
	Weekly	Total
Yellowfin Tuna	5	13
Skipjack	0	5
Wahoo	1	3
Mahi Mahi	1	6
Total	7	27

Oceanographic Operations (Candy Hall)

As expected, the sea surface temperatures (SST) have continued to rise as we entered and traversed the Gulf of California. Averaging in the late 30°C (90°F), this is definitely the first time I have found myself in comparable sea surface and air temperatures during the 04:30 am CTD! We've also noticed a slight rise in salinity levels (35.40 psu) since entering the Gulf, portrayed in both the surface TSG (thermosalinograph) and CTD traces. These water properties should decrease as we head southward to Mazatlan for a sweltering couple of anticipated days. Farewell Mark (Harris, teacher-at-sea)! Don't miss those early morning CTD's too much, you're always welcome back!

Date	**CTD**	**XBT**	**Bongo tow**	**Manta tow**
10 Aug	1	3	0	0
11 Aug	2	3	0	0
12 Aug	2	3	0	0
13 Aug	1	3	0	0
14-16 Aug*	0	0	0	0
Total	6	12	0	0

* in port in Mazatlan, Mexico